

WHAT IS CLAIMED IS

2w-A1) 5 1. A method for communicating in a distributed computing environment, comprising:

receiving a message in a data representation language from a source to be sent to a destination;

10 verifying type correctness of said message according to a data representation language schema;

attaching an authentication credential to said message, wherein said authentication credential identifies said source; and

15 sending said message to said destination.

20 2. The method as recited in claim 1, wherein said source is a client in the distributed computing environment and said destination is a service in the distributed computing environment, the method further comprising:

receiving said data representation language schema, wherein said data representation language schema defines a message interface for accessing the service; and

25 generating a message endpoint for the client according to said data representation language schema, wherein said verifying type correctness and said attaching an authentication credential are performed by said message endpoint for the client.

3. The method as recited in claim 2, wherein said data representation language schema defines a set of messages in the data representation language that said client may send to said service to access said service.

5 4. The method as recited in claim 3, further comprising said message endpoint for the client verifying that said message to be sent to said service complies with a data representation language message definition from said data representation language schema.

10 5. The method as recited in claim 3, further comprising said client obtaining from said message endpoint the set of data representation language messages that said client may send to said service.

15 6. The method as recited in claim 3, wherein said set of messages in the data representation language that said client may send to said service is a subset of all messages that can be handled by said service so that said client's access to said service is restricted.

20 7. The method as recited in claim 2, further comprising:

said message endpoint for the client receiving a data representation language message from said service, wherein said data representation language message from said service includes an authentication credential for said service;

25 said message endpoint for the client using said authentication credential for said service to authenticate said data representation language message from said service as being from said service; and

30 said client obtaining, from said message endpoint for said client, the authenticated message from said service.

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8. The method as recited in claim 7, wherein said data representation language schema defines a set of messages that said service may send to said client, the method further comprising said message endpoint for the client verifying the correctness of said data representation language message from said service according to said data representation language schema.

9. The method as recited in claim 2, further comprising binding said message endpoint for the client a single destination address so that said message endpoint only sends messages to said destination address.

10. The method as recited in claim 9, wherein said destination address is a Uniform Resource Identifier (URI) for said service, wherein said sending said message to a destination comprises sending said message to an address specified by said URI using a protocol specified by said URI.

11. The method as recited in claim 2, wherein said message endpoint for the client is a single atomic unit of program code that provides an abstraction for said service to said client.

12. The method as recited in claim 11, wherein said single atomic unit of program code is generated under control of said client's execution environment.

13. The method as recited in claim 2, wherein once generated said message endpoint for the client cannot be altered as to said verifying type correctness and said attaching an authentication credential.

14. The method as recited in claim 2, wherein said client comprises a client process and wherein said service comprises a service process, and wherein said client process is executable under a different type of execution environment than said service process.

15. The method as recited in claim 1, wherein said data representation language is eXtensible Markup Language (XML).

5 16. The method as recited in claim 1, wherein said source is a service in the distributed computing environment and said destination is a client in the distributed computing environment, the method further comprising generating a message endpoint for the service according to a data representation language schema, wherein said verifying type correctness and said attaching an authentication credential are performed by said  
10 message endpoint for the service, and wherein said data representation language schema defines a message interface between said service and said client.

17. A device, comprising:

15 a processor;

a memory coupled to said processor;

20 a message gate unit configured to:

receive a message in a data representation language from a source to be sent to a destination, wherein said source is a process executed by said processor from said memory;

25 verify type correctness of said message according to a data representation language schema;

30 attach an authentication credential to said message, wherein said authentication credential identifies said source; and

send said message to said destination.

18. The device as recited in claim 17, wherein said source is a client process in the distributed computing environment and said destination is a service in the distributed computing environment, the device is further configured to:

receive said data representation language schema, wherein said data representation language schema defines a message interface for accessing the service; and

10 generate said message gate unit according to said data representation language schema, wherein said verifying type correctness and said attaching an authentication credential are performed by said message gate unit.

19. The device as recited in claim 18, wherein said data representation language schema defines a set of messages in the data representation language that said client process may send to said service to access said service.

20. The device as recited in claim 19, wherein said message gate unit is further configured to verify that said message to be sent to said service complies with a data representation language message definition from said data representation language schema.

21. The device as recited in claim 19, wherein said client process is configured to obtain from said message gate unit the set of data representation language messages that said client process may send to said service.

22. The device as recited in claim 19, wherein said set of messages in the data representation language that said client process may send to said service is a subset of all messages that can be handled by said service so that said client process's access to said service is restricted.

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23. The device as recited in claim 18, wherein said message gate unit for the client is further configured to:

5 receive a data representation language message from said service, wherein said data representation language message from said service includes an authentication credential for said service;

10 use said authentication credential for said service to authenticate said data representation language message from said service as being from said service; and

15 wherein said client process is configured to obtain, from said message gate unit for said client, the authenticated message from said service.

24. The device as recited in claim 23, wherein said data representation language schema defines a set of messages that said service may send to said client process, wherein said message gate unit for the client is further configured to verify the correctness of said data representation language message from said service according to  
20 said data representation language schema.

25. The device as recited in claim 18, wherein said message gate unit for the client process is bound to a single destination address so that said message gate unit only sends messages to said destination address.

26. The device as recited in claim 25, wherein said destination address is a Uniform Resource Identifier (URI) for said service, wherein said message gate unit is further configured to send said message to an address specified by said URI using a protocol specified by said URI.

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27. The device as recited in claim 18, wherein said message gate unit for the client is a single atomic unit of program code executed by said processor that provides an abstraction for said service to said client process.

5 28. The device as recited in claim 27, wherein said device is configured so that said single atomic unit of program code is generated under control of device's execution environment.

10 29. The device as recited in claim 18, wherein said message endpoint for the client is configured so that once generated said message endpoint for the client cannot be altered as to verifying type correctness and attaching the authentication credential.

15 30. The device as recited in claim 18, wherein said client process is executable under a different type of execution environment than a service process for said service.

31. The device as recited in claim 17, wherein said data representation language is eXtensible Markup Language (XML).

20 32. The device as recited in claim 17, wherein said source is a service process in a distributed computing environment and said destination is a client in the distributed computing environment, the device further configured to generate said message gate unit for the service according to a data representation language schema, and wherein said data representation language schema defines a message interface between said service and said client.

25 33. The device as recited in claim 17, wherein said device is a computer system, mobile telephone, or personal digital assistant.

30 34. A carrier medium comprising program instructions, wherein the program instructions are computer-executable to implement:

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receiving a message in a data representation language from a source to be sent to a destination;

5 verifying type correctness of said message according to a data representation language schema;

attaching an authentication credential to said message, wherein said authentication credential identifies said source; and

10 sending said message to said destination.

35. The carrier medium as recited in claim 34, wherein said source is a client in the distributed computing environment and said destination is a service in the distributed computing environment, and wherein the program instructions are further computer-executable to implement:

20 receiving said data representation language schema, wherein said data representation language schema defines a message interface for accessing the service; and

25 generating a message endpoint for the client according to said data representation language schema, wherein said verifying type correctness and said attaching an authentication credential are performed by said message endpoint for the client.

36. The carrier medium as recited in claim 35, wherein said data representation language schema defines a set of messages in the data representation language that said client may send to said service to access said service, and wherein the program instructions are further computer-executable to implement:



said message endpoint for the client verifying that said message to be sent to said service complies with a data representation language message definition from said data representation language schema.

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37. The carrier medium as recited in claim 35, wherein the program instructions are further computer-executable to implement:

10 said message endpoint for the client receiving a data representation language message from said service, wherein said data representation language message from said service includes an authentication credential for said service;

15 said message endpoint for the client using said authentication credential for said service to authenticate said data representation language message from said service as being from said service; and

said client obtaining, from said message endpoint for said client, the authenticated message from said service.

20 38. The carrier medium as recited in claim 37, wherein said data representation language schema defines a set of messages that said service may send to said client, and wherein the program instructions are further computer-executable to implement:

25 said message endpoint for the client verifying the correctness of said data representation language message from said service according to said data representation language schema.

30 39. The carrier medium as recited in claim 35, wherein the program instructions are further computer-executable to implement:

binding said message endpoint for the client a single destination address so that  
said message endpoint only sends messages to said destination address.

40. The carrier medium as recited in claim 39, wherein said destination address is a  
5 Uniform Resource Identifier (URI) for said service, and wherein, in said sending said  
message to a destination, the program instructions are further computer-executable to  
implement:

10 sending said message to an address specified by said URI using a protocol  
specified by said URI.

41. The carrier medium as recited in claim 35, wherein said message endpoint for the  
client is a single atomic unit of program code that provides an abstraction for said service  
to said client.

42. The carrier medium as recited in claim 34, wherein said data representation  
language is eXtensible Markup Language (XML).

43. The carrier medium as recited in claim 34, wherein said source is a service in the  
20 distributed computing environment and said destination is a client in the distributed  
computing environment, and wherein the program instructions are further computer-  
executable to implement:

25 generating a message endpoint for the service according to a data representation  
language schema, wherein said verifying type correctness and said  
attaching an authentication credential are performed by said message  
endpoint for the service, and wherein said data representation language  
schema defines a message interface between said service and said client.